



IN THE UNITED STATES PATENT OFFICE

Seulberger et al.

U.S. Application Serial No. : 09/462,629

Filed: January 11, 2000

For: „DNA sequence encoding a hydroxyphenylpyruvate dioxygenase, and its overproduction in plants“

DECLARATION

I, Ralf Michael Schmidt, Dr. rer. nat., a citizen of the Federal Republic of Germany and residing at D-67489 Kirrweiler, Am Schloßgarten 9d Federal Republic of Germany declare as follows:

I am a biochemist, having studied biochemistry in the period 1977 to 1986 at the University of Münster, Federal Republic of Germany.

I obtained my doctor's degree from the University of Münster in 1986.

I joined the BASF AG, Carl-Bosch str. 38, 67056 Ludwigshafen, Federal Republic of Germany, in 1986.

Since 1994 I have been engaged in work in the field of plant biotechnology.

I am one of the inventors of the invention disclosed and claimed in Application Serial No. 09/462,629 and I am therefore familiar with the field to which the said application relates.

I intensively studied the Office Action mailed October 19, 2004 and know that the Examiner has rejected our claims 1 to 16 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement and does not reasonably provide enablement for an isolated DNA encoding any barley HPPD.

However, the person skilled in the art is able without any undue burden to isolate genes encoding for HPPDs from the genus *Hordeum* on the basis of the sequence information disclosed in the application at hand by using the state of the art techniques disclosed in the specification of said application (see specification page 7, lines 12 to 26 and examples 1 and 2).

These and other techniques were established and well known in the art at the priority date of said application.

To demonstrate the significant degree of identity between the different HPPDs sequences even if they do not belong to the same genus, we compared the HPPD encoding DNA sequence of the invention with a DNA sequence encoding the *Oryza sativa* HPPD using standard sequence comparison tools.

Under consideration of the above given arguments, the identity between the claimed genes belonging to the genus *Hordeum* has to be expected to be at least 95%.

	H. vulgare) PPD	O. sativus) PPD
H. vulgare) PPD	[100]	[84]
O. sativus) PPD		[100]

Identities in %

		1	50
H. vulgare HPPD	(1)	ATGCGCGCCACCCCGCACCAACCCCGGGGTACCGGGGCG	-----CGGC
O.sativa HPPD	(1)	ATGGGTCCCACTCCCAACCCCAACGCAACCGGCGCGGTCTCGGGCG	CG
		51	100
H. vulgare HPPD	(45)	CGCGGTGACGCCGGAGCACGGSCGA--CGCA-----CGGAA	
O.sativa HPPD	(51)	TGCGCGGGCGGGGAGAACGCGGGGTTCGCTCGTCTCGGGCACCGCGCT	
		101	150
H. vulgare HPPD	(80)	TGGTCCGCTTCAACCCCGCGACGCGACCGCTTCCACAGGCTGTCTTCC	
O.sativa HPPD	(101)	TCCGTCCGCGCCCAACGCGCGGAGCGACCGGTTCGAGGCGGTTCGGTTCAC	
		151	200
H. vulgare HPPD	(130)	CACGTCCGAGTTCTGGTGGCGGGAACCGCGCTCGGCGCGCGCGCTTCC	
O.sativa HPPD	(151)	CACGTCCGAGCTCTGGTGGCGCGGACCGCGCGTCCGCGCGCGCGCGTTC	
		201	250
H. vulgare HPPD	(180)	GTTCCGCGCTCGGCGCGCGCGGTTCGCGCGGAGCTCCGAGGCTTCAGGGGGA	
O.sativa HPPD	(201)	CTTCCGCGCTCGGCGCGCGCGGTTCGCGCGGAGGCTTCGAGGCTTCAGGGGGA	
		251	300
H. vulgare HPPD	(230)	ACTCCGCGGAGCGCTCCAGGTGCTCGGCTCGGGGTCTCTAGACCTCTCT	
O.sativa HPPD	(251)	ACTCCGCGGAGCGCTCCCTCTCTCTCTCGGCTCCGCTCTCTCTCTCTCT	
		301	350
H. vulgare HPPD	(280)	TTTACCGCGCCCTACGCCA-----AGGCTCGGAGGCG-----G	
O.sativa HPPD	(301)	TTTACCGCGCCCTACGCGCGGCGACCGGCTCGGCGGCGGACGCGGCCAG	
		351	400
H. vulgare HPPD	(315)	CACCGCTTCCCTGCGCTCTTCTCTCGGCGGACCGCGGCGCGCGCTTCTGG	
O.sativa HPPD	(351)	CACCGCTTCCCTGCGCTCTTCTCTCGGCGGCGCGCGCGCGGAGGTTCTGG	
		401	450
H. vulgare HPPD	(365)	CCGACACGGGATGCGGCTCGGCTCGGAGGCTCGGAGGCTCGGAGGCTCG	
O.sativa HPPD	(401)	CCGACACGGGCTCGGCTCGGAGGCTCGGAGGCTCGGAGGCTCGGAGGCTCG	
		451	500
H. vulgare HPPD	(415)	CCGAGGCGCTTCCGCGCTCACTCGGTCGACGG--CGCGCGGCGCGCGCTTCG	
O.sativa HPPD	(451)	CCGAGGCGCTTCCGCGCGAG--CGTCCGCGCGGCTCGGAGGCGCGCGCTTCG	
		501	550
H. vulgare HPPD	(464)	CCCGCTCGGACCTCGGCGCGCGGCTTCCGCTTCGCGGAGGCTCGGAGGCTTC	
O.sativa HPPD	(500)	AGCGCTCCGACCTCGCGGCTTCGCGCTTCGCGGAGGCTCGGAGGCTTCG	
		551	600
H. vulgare HPPD	(514)	GGCGAGCTTCTTCCGCTTCGTCAGCCACCGGAGGCTCGGAGGCTTCG	
O.sativa HPPD	(550)	GGCGAGCTTCTTCCGCTTCGTCAGGCAACCGGAGGCTCGGAGGCTTCG	
		601	650
H. vulgare HPPD	(564)	CTTCTTCCCGGGTTTCGAGGTCGTAACCAACCGGAGGCTTCGAGTTCG	
O.sativa HPPD	(600)	CTTCTTCCCGGGTTTCGAGGTCGTAACCAACCGGAGGCTTCGAGTTCG	
		651	700
H. vulgare HPPD	(614)	GCGTACGCGGTTTCGAGGCTTCGTCAGGCAACCGGAGGCTTCGAGTTCG	
O.sativa HPPD	(650)	GCGTACGCGGTTTCGAGGCTTCGTCAGGCAACCGGAGGCTTCGAGTTCG	
		701	750
H. vulgare HPPD	(664)	GCCGACGCTTACATCCGCGGTTTACCGGGTTTCGAGGCTTCGAGTTCG	
O.sativa HPPD	(700)	GTAGCCCGGTACATCTCCGCGTTTACCGGGTTTCGAGGCTTCGAGTTCG	
		751	800

H. vulgare HPPD	(714)	CHCGGCGGAGGACCTGGGCAAGACCGAGAGCGGCGTCACTTCTGGTCC	
O. sativa HPPD	(750)	CHCGGCGGAGGACCTGGGCAAGACCGGCGAGAGCGGCGTCACTTCTGGTCC	850
		801	
H. vulgare HPPD	(764)	TCCGCAACAACTCCGAGGGCTTCTGTGCGGCTCACTTCTGGTCC	
O. sativa HPPD	(800)	TCCGCAACAACTCCGAGGGCTTCTGTGCGGCTCACTTCTGGTCC	900
		851	
H. vulgare HPPD	(814)	GGCAGCAAGCGCGGAGCCAGATACAGACGTTCTTCCAAAGCGCGGCGG	
O. sativa HPPD	(850)	GGCAGCAAGCGCGGAGCCAGATACAGACGTTCTTCCAAAGCGCGGCGG	950
		901	
H. vulgare HPPD	(864)	CCCAGGCGTGACCAATCGGGGTGGCCAGGAGTCTCTTCTTCCAGGAGCG	
O. sativa HPPD	(900)	CCCAGGCGTGACCAATCGGGGTGGCCAGGAGTCTCTTCTTCCAGGAGCG	1000
		951	
H. vulgare HPPD	(914)	TCAGGAAGATCGTGCGGCTCGGCGATGGGGGGCTTCTTCTTCCAGGAGCG	
O. sativa HPPD	(950)	TCAGGAAGATCGTGCGGCTCGGCGATGGGGGGCTTCTTCTTCCAGGAGCG	1050
		1001	
H. vulgare HPPD	(964)	CCCCGCGTGCGCAAGTACTACGAAGGCGTGCGGCGCTTCTTCTTCCAGGAGCG	
O. sativa HPPD	(1000)	CCCCGCGTGCGCAAGTACTACGAAGGCGTGCGGCGCTTCTTCTTCCAGGAGCG	1100
		1051	
H. vulgare HPPD	(1014)	CCTCTCGGAGGCGGAGATCAAGGAATGCCAGGAGTCTCTTCTTCCAGGAGCG	
O. sativa HPPD	(1050)	CCTCTCGGAGGCGGAGATCAAGGAATGCCAGGAGTCTCTTCTTCCAGGAGCG	1150
		1101	
H. vulgare HPPD	(1064)	ATAGGGACGACCAAGGGGTGTGCTTCCAAATCTTCTTCTTCCAGGAGCG	
O. sativa HPPD	(1100)	ATAGGGACGACCAAGGGGTGTGCTTCCAAATCTTCTTCTTCCAGGAGCG	1200
		1151	
H. vulgare HPPD	(1114)	GACAGGCGGACCTTGTTCCTCCAGATGATCCAGAGGATCGGCTGCAATGGC	
O. sativa HPPD	(1150)	GACAGGCGGACCTTGTTCCTCCAGATGATCCAGAGGATCGGCTGCAATGGC	1250
		1201	
H. vulgare HPPD	(1164)	GAAAGCAACGAGAGGGGGAAGTACCAGAGGGGTGGCTTGGCGGGGTTCG	
O. sativa HPPD	(1200)	GAAAGCAACGAGAGGGGGAAGTACCAGAGGGGTGGCTTGGCGGGGTTCG	1300
		1251	
H. vulgare HPPD	(1214)	GCAAGCGGACCTTCTCCGAGGTGTTTCACTCCATTCAAGATACAGAGAG	
O. sativa HPPD	(1250)	GCAAGCGGACCTTCTCCGAGGTGTTTCACTCCATTCAAGATACAGAGAG	1342
		1301	
H. vulgare HPPD	(1264)	TCCCTTCAAGGCAAGCAATCTGTGTGAGTTGAGGAGTCAAGGAGTCAAGG	
O. sativa HPPD	(1300)	TCCCTTCAAGGCAAGCAATCTGTGTGAGTTGAGGAGTCAAGGAGTCAAGG	

Higgins, D., J. Thompson, T. Gibson, J. D. Thompson, D. G. Higgins, T. J. Gibson. 1994. ClustalW: improving the sensitivity of progressive multiple sequence alignment through sequence weighting, position-specific gap penalties, and weight matrix choice. Nucleic Acids Research 22:4673-4680.

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I further declare that all Statements made herein of my own knowledge are true and that Statements made on information or belief are believed to be true; and further that these Statements are made with the knowledge that willful false Statements and the like so made are punishable by fine or imprisonment , or both, under Section 1001 of Title 18 of the United States Code and that such willful false Statements may jeopardize the validity of the application or any patent issuing thereon.

Signed at 67056 Ludwigshafen, Germany, December 15, 2004

A handwritten signature in black ink, appearing to read "R. U. Schmitt". The signature is written in a cursive, flowing style.

signature of declarant